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RALPH W. TYLER

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Studies of the Bing Law
ARCH O. HECK

Vol. X
No. 5

MARCH 4, 1931

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What Is Statistical Significance?

By RALPH W. TYLER

The term "statistically significant" abounds in current reports of educational investigations. Two examples may serve for illustration. In Wood and Freeman's recent study of classroom moving pictures the results of an achievement test given to classes in general science which had utilized moving-picture films as a part of the teaching method were compared with the results obtained by classes not using the films. The differences were reported as statistically significant. In Hudelson's studies of class size, the achievement-test records of large classes in the University of Minnesota were compared with the results obtained from small classes, and the differences were said to be not statistically significant.

What is meant by statistical significance? Is a difference which is statistically significant necessarily of social significance? When a difference is reported as not of statistical significance, does it necessarily follow that there exists no difference of any importance? The interpretations which have commonly been drawn from recent studies indicate clearly that we are prone to conceive of statistical significance as equivalent to social significance. These two terms are essentially different and ought not to be confused.

The difference between the terms may, perhaps, be more clearly presented through illustrations chosen outside of the field of education. Suppose two herds of twenty-five cattle each were being fed two different diets, and were being weighed from time to time to determine which herd was gaining more weight. Let us present some hypothetical data to illustrate statistical significance. The total weights of the two herds at the beginning of the experiment were the same. At the second weighing some of the steers in the first herd had gained a great deal of weight, and others had gained but little.

The same was true in the second herd. Nevertheless, the average gain in the first herd was 187 ± 1 pounds per steer, while the average gain in the second herd was only 181 ± 1 pounds. The difference in average gain between the two herds was 6 ± 1.4 pounds. By our usual criteria this is a statistically significant difference. We can be practically certain that with two other much larger herds chosen in the same way and fed the two diets, those fed upon the diet given the first herd would show greater gain.

The greater gain of the first herd is statistically significant, but is it significant for the cattle feeder? Here is an added gain of 6 pounds per steer. Applying the usual interpretation of probable error, we can be practically certain that other similar herds would not show less than .5 pounds nor more than 11.5 pounds greater gain per steer. Is this gain worth the cost? Obviously, that is another question altogether, and cannot be answered in terms of statistical significance. We should need to know the cost of this diet which brings added weight, and the difficulties which might attend its use. The fact that the gain in weight made by the first herd is statistically significant does not prove that the gain is worth the cost.

THIS illustration serves equally well for the field of education. Scientific studies of learning and teaching which reveal statistically significant differences in the effects of various materials or methods should be continued or supplemented so as to indicate the social importance of a difference together with its social cost. For example, in a recent study we found that a definite program of conferences between instructors and students in Ohio State University resulted in an increased achievement equivalent to 17 points on a comprehensive achievement test. Readers want to know, and the investigators should make it a point to report, how much this difference is and how much it costs. We discovered, for example, that the interviewed students accomplished as much in ten weeks as the others did in twelve, that the students liked the informal contacts with the faculty, and that to provide for conferences required one-third more instructors. This sort of information helps the readers to interpret and to utilize such investigations.

Differences which are statistically significant are not always socially important. The corollary is also true: differences

which are not shown to be statistically significant may nevertheless be socially significant. Again, an example chosen from without the field of education may serve as a better illustration. Suppose that the gasoline consumption of two automobiles were being compared by running them both around a two-mile track, measuring the gasoline in the tank before and after the run. Suppose, further, that a quart measure were the only measuring device available. Ten times the gasoline consumption was measured, and each time the closest estimate which could be made with the quart measure was that each machine had consumed about a pint in running around the track.

If this were an educational investigation the difference in gasoline consumption of the two machines would be reported as "not statistically significant." Readers would interpret the report as showing that there was no difference in the gasoline consumption of the two automobiles. Would this be a valid interpretation? Certainly not. No difference was found, but it is apparent to us that the technique of measurement is entirely too crude for the purpose. Either a smaller gasoline measure should be used, or longer runs should be made. When the two automobiles were run for sixty miles, the first consumed only three gallons of gasoline, while the second consumed four. Here was a difference of real importance which, through lack of refined methods of measurement, failed at first to be revealed as statistically significant.

SIMILAR illustrations are available in studies of learning and teaching. A recent investigation of large and small classes compared the gains made in one semester on a standard test. The average gain during the semester made by the large class was only 8.2 ± 1.5 points, and by the small class, 9.1 ± 1.6 points. It is evident that the difference between the gains made by the two classes is not statistically significant. Is there no difference of any social importance? This question cannot be answered by the use of a technique of measurement so unrefined. The probable error of the gain in each of these classes is approximately 1.5 points. Ordinarily, we demand a difference of at least 3 times the probable error to be certain that there is a real difference which is probably not due to the unreliability of the measurements. In this case, then, a gain of at least 4.5 points is required for the gain to be statistically

significant. Since in the entire 18 weeks of the semester the classes gained only about 9 points, it is apparent that the test used was so crude a measuring instrument that for statistical significance a difference would need to be equivalent to nine entire weeks of instruction. Suppose one of the classes was actually superior to the other in attainment by an amount equal to four weeks of instruction. To be four weeks ahead at the end of a semester would certainly be important socially, but such a difference would not even be statistically significant with the crude measurements of this test. Really important differences may not be revealed as statistically significant when the methods of measurement are not sufficiently refined.

More refined tests for such purposes can be constructed by increasing their length and reliability. In the study at Ohio State University, referred to previously, in which the effects of conferences between instructors and students were determined, we found that the first test used would not reveal a statistically significant difference which was less than that gained by a class during three weeks of instruction. By revising and lengthening these tests we are able to develop measuring instruments that would indicate differences which were statistically significant even when these differences were as small as the gain made by a class in one week of instruction. Most comparisons of teaching methods and materials require measurements correspondingly refined.

THE implications of the distinction between statistical significance and social importance should be apparent to all research workers. Upon us is placed the responsibility, first, of determining whether real differences exist and then of indicating their social importance and their cost. When we fail to find any statistically significant differences, we are not justified in concluding at once that no real differences exist. We bear the responsibility for developing appropriate techniques of measurement, methods so accurate that if there are any real differences of importance they will be revealed with some precision. These measures must be so refined that we can determine differences which though small may be worth the effort to attain.

When we have measured differences with such precision,

[*Continued on page 142*]

Difficulties in Vocabulary Research

By EDGAR DALE

THERE are certain difficulties in the field of vocabulary research which are universally encountered by workers in this field. The writer believes that it will be of value to those interested in this type of research to state some of these difficulties and suggest, in certain cases, the techniques that might be set up to meet them.

The first and major difficulty facing the person who attempts to do research in this field is the lack of adequate bibliographies. This inadequacy is heightened by the fact that the best studies in the field are unpublished Masters' or Doctors' theses, some of which are unavailable even through interlibrary loans. The writer has been collecting and summarizing articles, books, and theses in this field for five years, and this bibliography will be available at some future date.

Since vocabulary research is concerned with words, it is necessary to indicate what we mean by a word, an exceedingly difficult task. Thorndike, for example, in his vocabulary study tabulated the words *boy* and *boys*, *berry* and *berries* as single words. This was done under the assumption that plurality adds little to the difficulty of a word. The assumption is probably sound except when applied to very immature children, but it is probably not valid if applied to the adding of certain suffixes to words. For example, a child that knows *bad* is likely to know *badly*, but is there not a distinct increase in difficulty between the words *good* and *goodly?* Even Thorndike does not follow his own rules completely, because he makes exceptions "for special reasons" and says that, "Where separate entries do occur, it is because the derived word is likely to offer some difficulty to pupils, and not to be known easily from knowledge of the primary word." A great deal of data relative to the change in difficulty of words due to adding prefixes or suffixes is necessary before we can settle the problem of how specific our testing of a word must be. For example, we need to discover whether it is safe to assume that an eighth-grade pupil will know the word *authorize* if he knows the word *authority*; at what age we can expect a child to generalize the meaning of the suffixes *tion*, *ment*, *ness*, *ly*,

and many others. Once having discovered the level of maturity at which, let us say, the suffix *tion* does not increase the difficulty of the root of which it is added, our testing problem becomes greatly simplified.

WHAT do we mean when we say that a child knows a word? Are not the dangers inherent in the use of the word *know* so great that it might be eliminated altogether from the vocabulary of research workers in this field? The difficulties involved in the use of the word are these: First, since there are accretions to the meanings of most words throughout one's entire life, *know* is a relative term. Second, for practical purposes, knowing must be defined in terms of specific reactions that one is able to make in reference to a word. For example, on Terman's test of the word *chair* at the five-year-age level, a definition in terms of use is satisfactory, namely, "to sit on," "you sit on it." However, at the eight-year level the definitions for the words must be superior to use. For example, the definition of *football*, "it is made of leather and is stuffed with air," is satisfactory, but, "what they play with" is unsatisfactory.

It appears, therefore, that if the research worker wishes to use the word *know* as part of his research equipment, it must be carefully defined. The writer finds the following statement helpful in his thinking in relation to this problem: A word is known by an individual when he can successfully react to it on the basis of the legitimate demands made upon him by his environment. Our research problem then becomes the task of discovering what reactions to words the environment can legitimately demand of the individual at every age level.

What can the environment of the three-year-old child legitimately demand in reference to the word *radio*? The parent probably will say to the child, "Do not touch the radio," or "Shut off the radio," or "Do you like the radio?" A valid test of the child's ability to understand the word at this level of maturity is his ability to react satisfactorily to these situations.

The discussion just given leads us inevitably to a fourth difficulty in vocabulary research; namely, the kind of test which we shall use? For younger children who are unable to read or write, testing is largely a matter of setting up a situation where the desired reaction can ensue. For older children,

paper and pencil tests can be utilized, and they are of several varieties, namely, true-and-false, multiple-choice, completion, and matching tests. There is, also, the method by which the pupil is asked to indicate whether he knows the word as it appears either in a list or in context.

No matter what type of test is utilized, we are faced with the criterion of validity, and this criterion is satisfied only when we are sure that the test results indicate whether the desired reaction to the word can be made. For example, let us suppose that we have formulated a multiple-choice test on the word *quotient*, a word which occurs frequently in arithmetic textbooks. The tests should be given credit for validity only when the investigator has definitely proved that the ability to pass the test successfully indicates that the child will be able to react satisfactorily to the word as it appears in his arithmetic work. Many vocabulary tests are of doubtful validity if the standards here set up are legitimate.

A SIXTH difficulty relates to the method for analyzing the vocabulary of textbooks. Several methods are used. One is to tabulate every word that appears in the textbook. This method is exceedingly laborious and results in the tabulation of a prodigious number of words. An improvement on this method is to eliminate from tabulations, words so easy that they will likely never cause vocabulary difficulty. For example, if we omit from our tabulation the thousand most common words in the Thorndike list, we will dispense with 80 to 90 per cent of the words.

Two criteria for eliminations need to be set up at this point. The first is this: no eliminations from tabulations should be made of words which are likely to cause reading difficulties. Second, the need for comparable data from the various textbooks in a subject dictates the necessity for common agreement as to what words should be eliminated.

The financial cost of work in this field offers another difficulty. With a few exceptions, the work of tabulation thus far done has been furnished by students working on minor- or major-research problems. In only a few cases have research bureaus made careful studies in this area. It would appear that since the major task of the school is the transmission of meanings, it should be exceedingly valuable to have data

regarding the difficulty of these meanings. Vocabulary research deserves more financial support than has hitherto been secured.

A final difficulty, and perhaps the most serious one of all, is the failure of research results in the field of vocabulary to penetrate into practice. Consider the following fact: There have been at least twenty studies of the vocabulary of elementary history books. Every study reached the unequivocal conclusion that the vocabulary was far too difficult, that there was a poor selection of the technical terms taught, that difficult technical words were needlessly introduced, and that difficult words are not repeated enough to secure adequate learning.

What has happened to the elementary textbooks in history as a result of these studies? Out of twenty books published during 1927 or after, and selected at random from the textbook collection in the library of the Bureau of Educational Research, seven made reference in the Preface to the vocabulary of the book. Only two authors had tried out the history materials experimentally before the books were published. The authors of three of the books indicated that the words were checked by graded word-lists, but did not state, except in one case, the list used. One said that the vocabulary was tested for fourth-grade children, but did not indicate how this was done, and the text contained many difficult words. Another presented a list of new words at the end of each chapter. Two stated that the vocabulary would be understood by a child of ten. An examination of one of the books indicated that this was likely to be true. On the first page of the other, however, we find the words: *foe, profoundly, gallant, yeoman-service, eloquently,* and *convincing.* On page 2 we have the words: *pre-eminent, petition, independent, series, depressed,* and *capable.* We see, therefore, that only two or three of twenty books have actually utilized any careful scientific procedure in checking their list.

We are inevitably led to the conclusion that the research worker in the field of vocabulary must lay rather definite plans for the utilization of his results if he hopes to have them affect school practice. Perhaps the most effective way of doing this would be to refer to the textbooks analyzed by name, instead of by code number, as is so commonly done. Nothing will affect the vocabulary of textbooks so much as widespread publicity to the data secured by our analyses.

Problem Solving in Arithmetic

By W. J. OSBURN AND L. J. DRENNAN

THE purpose of this study was to determine what transfer, if any, takes place from arithmetic problems which are specially taught to those which are not given particular mention in instruction. The study was carried on by the authors in the Madison Elementary School at Wheeling, West Virginia.

A series of problem cues in addition, subtraction, multiplication, and division was so arranged as to include the problems which are most representative of the work which should be done in the third grade. A *cue* was defined as the part of a problem which is expressed in language. The cues in the series were those which occur most frequently in five widely used textbooks. This series, or list of cues, was given to the teachers of the third grade as early as possible after the opening of the school term with the instructions that they were to be taught during the first six weeks. At the end of this period the pupils were tested with a set of problems containing cues which were entirely different from those which had been practiced, but there were no additional difficulties in vocabulary. The scores of the pupils were then tabulated to show the kinds of cues the pupils were able to handle without direct teaching. The pupils were also tested, using problems which contained a new set of cues which had not been practiced and including as well certain additional vocabulary difficulties. The results were then listed for comparison, in order to ascertain to what extent, if any, the learning of one set of cues transfers to that of another.

The study was made in the second half of the third-grade work, since the four fundamental processes in arithmetic had not been taught until then. The Madison School had mid-year promotions, and the first half of the grade were called the B group and the second half, the A group. The pupils of a third-grade A group were used in this study.

There were two sections of the group, and two teachers helped to carry on the study. They gave their word of honor that they had taught nothing in arithmetic during the six weeks but the approved cue problems plus regular drill in fundamentals.

In order to allow for holidays which entered into the school year, six weeks were defined as thirty actual recitations in arithmetic. The teachers at the end of the period felt that all of the pupils in their sections understood and could solve all of the cue problems. No home work was assigned during this time, and no effort was made to have the pupils study anything in the textbook except the fundamental processes. It can be reasonably assumed that they did not study other cues.

The list of cues that were taught follows, and various numbers were supplied from day to day advancing in difficulty with the successful attainments of the pupils:

ADDITION

1. One hen has ..... chickens. Another has ..... How many chickens have both hens?

2. Gertrude is ..... years old. Her sister is ..... years older. How old is her sister?

3. William buys a top at the toy shop for ..... cents, a kite for ..... cents, and some marbles for ..... cents. How much did he spend?

4. After spending ..... cents for bread, Frank has ..... remaining. How much money had he at first?

SUBTRACTION

1. John buys a pencil for ..... cents. He gives the clerk ..... cents. How much change does he receive?

2. Albert had ..... pencils and lost ..... How many pencils had he then?

3. I earned ..... cents, and spent ..... cents for a tablet. How many cents have I left?

4. Some hunters killed ..... of the ducks in a flock containing ..... ducks. How many were not killed?

5. There are ..... children in a class of which ..... are boys. How many girls are in the class?

6. Dorothy had ..... pieces of candy of which ..... were chocolates, the remainder peppermints. How many pieces were peppermints?

7. A park has ..... deer and ..... monkeys. How many more deer are there than monkeys?

8. John weighs ..... pounds and James weighs ..... pounds. What is the difference between their weights?

MULTIPLICATION

1. Mary put ..... two-cent stamps on a package. How much did the stamps cost?

2. John has ..... apples. Albert ..... times as many. How many apples has Albert?

3. Sam has ..... pairs of doves. How many doves has he?

4. How much will ..... apples cost at ..... cents each?

5. At ..... cents each, what will the following cost: ..... oranges, ... packages of mints, ... ice-cream cones, ... chocolate bars, ... sandwiches, and ..... car fares?

6. There are five cents in a nickel. How many cents are there in ..... nickels?

7. If sugar is put up in ..... sacks, how many pounds will ..... sacks contain?

8. The price tag on the jelly-bean box in the candy store says: ..... for ..... cents. How many jelly beans can you buy with ..... cents?

9. There are ..... sticks of chewing gum in a package. I bought ..... packages. How many sticks of gum did I get?

10. How many cents are there in ..... dimes?

DIVISION

1. There are two pints in a quart. How many quarts are there in ..... pints?

2. ..... cents will buy how many two-cent stamps?

3. Mrs. Jones told her two little daughters, Ethel and Agnes, that she would give them both ..... cents if they wiped the dishes every night for a week. At the end of the week what was each girl's share?

4. At a party ..... children were asked to choose partners for a game. How many pairs of partners were there?

5. At ..... cents each how many bars of candy can you buy for ..... cents?

6. Grandfather Gray divided ..... acres of land equally among his ..... grandchildren. How many acres did he give to each grandchild?

It should be understood that the teacher did not use all of the cues every day. They were taught a few at a time, and new ones from the list were added as soon as the first ones were learned. This was continued until all the cues were mastered.

On the thirtieth day an examination consisting entirely of new cues was given. The first ten of the twenty problems were given in the morning before recess; thirty minutes was allowed for their solution. The last ten were given after recess with the same time limits as the earlier test. Both sections started their examinations at exactly the same time, and closed at exactly the same time. The work was done in the home rooms with the regular teacher writing the questions on the board. Regular examination paper was used, and extra paper was furnished for purposes of calculation. The papers were scored by one of the authors.

On the thirty-first day a similar examination was given including new cues with added difficulties of vocabulary. The first five and the last five problems in the first examination and in the second follow:

FIRST EXAMINATION (New cues but no new difficulty)—

1. How much do you pay for a ball and a bat if each costs 25 cents?

2. I had $75. I paid $38 for clothes. How much have I remaining?

3. How many paws have 8 dogs?

4. Charles found 10 nickels and gave half of them to Howard. How many did Charles give to Howard? How many did he keep?

5. One day a circus came to town. In the afternoon 355 people went to the show. In the evening 429 people went. How many people went to the circus that day?

. . . . . .

16. How many days from October 11 to October 25?

17. A milkman has 6 quarts of cream. He wants to put it into pint bottles. How many pint bottles will he need?

18. How many days are there in 3 weeks?

19. John is 15 years old. Henry is 12 years old. How much older is John than Henry?

20. Henry is digging a ditch. He digs 5 yards in one day. How many will he dig in 9 days?

SECOND EXAMINATION (Added vocabulary difficulty)—

1. How much do you pay for a narcissus and a crocus if each costs 25 cents?

2. I had $75. I paid $38 for gypsum. How much have I remaining?

3. How many paws have 8 bears?

4. Charles found 10 tortoise shells and gave one-half of them to Howard. How many did Charles give Howard? How many did he keep?

5. One day a comedian came to Reno. In the afternoon 355 adults observed the comedian. In the evening 429 adults attended. How many adults observed the comedian that day?

. . . . . .

16. How many days from April 11 to April 25?

17. A chemist has 6 quarts of sulfuric acid. He wants to put it into pint bottles. How many pint bottles will be needed.

18. How many months are there in 8 weeks?

19. Julius is 15 years old. Winfield is 12 years old. How much older is Julius than Winfield?

20. Henrik is excavating a trench. He excavates 5 yards in one day. How much will he excavate in 9 days?

None of the cues in either of the examinations had ever been taught previously to any of these pupils. Probably, none of the pupils had ever seen or heard of them before.

Numerous mistakes due to ordinary errors in fundamentals were found in scoring the test. Here and there the fundamental processes had not been thoroughly mastered. If on the score sheet all mistakes were counted, an accurate picture of the amount of transfer would not be given. If, on the other hand, errors in fundamentals were not counted, the record would not be complete. In order to disclose the results under both conditions, two records are given in Table I. In Column

TABLE I

SUMMARY OF SCORES MADE IN SOLVING NEW PROBLEMS

MEANS OF THE SCORES MADE BY THE	INTELLIGENCE QUOTIENTS	TEST I		TEST II	
		No New Difficulty (All Mistakes Counted)	No New Difficulty (Method Mistakes Counted)	Vocabulary Difficulty (All Mistakes Counted)	Vocabulary Difficulty (Only Mistakes Counted)
(1)	(2)	(3)	(4)	(5)	(6)
Upper two quartiles in intelligence.....	108.8	80.0	84.5	88.5	91.2
Lower two quartiles in intelligence.....	91.3	68.5	76.9	74.6	80.5
Range.....	73–119	10–100	35–100	25–100	40–100

3 the scores are those which result from taking all mistakes into account. Column 4 represents the same scores when method mistakes only were counted. Each problem correctly solved was given a value of five, so that the maximum possible score is one hundred points on each examination. The intelligence quotients were obtained from the records of the Research Director of Wheeling Independent School District.

THE data in Table I show that there is a marked amount of transfer. Here we have pupils making substantial marks on types of problems that had not been taught to them at any time. In Test I with all mistakes counted more than 70 per cent of the pupils received passing grades (70 or more). When method mistakes only are counted, the percentage who receive passing marks is more than 80. On Test II, in spite of vocab-

ulary difficulties, the pupils curiously enough did even better. Approximately 90 per cent of them attained passing marks. The results from Test II seem to indicate that pupils are able to sense the meaning of problems even if they do not understand all the words. There is a possibility, also, that since mainly just "nouns" were changed, and since the test was given the next day after the first test, that the pupils sensed the similarity of Test II with the test of the day before.

The means of the upper intelligence quartiles compared with those for the lower quartiles show that the more intelligent pupils do markedly better in problem solving. This is entirely in line with the known facts concerning transfer. Transfer always takes place more readily in the learning of children of high intelligence.

The results of this study show, however, that there is also marked transfer even in the case of pupils of low intelligence. These facts indicate that we are at last coming upon a sound technique for problem solving. After many disappointments we can pin our faith on this simple procedure. Teach a few of the most important problem types thoroughly, and depend upon transfer for the remainder. Future research will undoubtedly bring about a better selection of types of problems to be taught. When this has happened, we shall undoubtedly achieve even better results than those indicated in this study, but we may be greatly encouraged by the knowledge that we have at last got on the right track.

[Vol. X, No. 5]

Studies of the Bing Law

By ARCH O. HECK

DURING the summer of 1929, L. H. Munzenmayer, of the State Department of Education, and the writer began a co-operative study of the various problems related to the operation of the familiarly known "Bing Law," the compulsory school-attendance and child-labor law of Ohio.[1] Many questions had arisen concerning the operation of this law during the preceding session of the legislature. When those

[1] Material presented in this article is a summary and forecast of the complete study now in press entitled *A Study of the Ohio Compulsory School Attendance and Child Labor Law* which will appear as Bureau of Educational Research Monograph, No. 9.

interested sought to obtain facts concerning the many questions raised by both the friends and the opponents of the Law, they discovered little real and definite knowledge.

Various criticisms were made, such as that the attendance law of Ohio resulted in vastly increasing school costs throughout the state, in lowering standards of high-school achievement, in forcing all youths under eighteen years of age into school, in lowering the pupil's respect for law because the present attendance law was not enforced or enforceable. When attempts were made to evaluate these criticisms, it was discovered that evidence upon these points consisted largely, either of special instances, which had come to the attention of the individual making the criticism, or of personal opinion as to what was likely to happen under this law. Since the personal experiences and opinions of individuals differ greatly, the evidence brought to bear upon these problems differed just as radically as did these experiences and opinions.

THE members of the Committee, therefore, in organizing the work kept always in mind the necessity of securing objective evidence concerning those problems which were selected for study. Criticisms of the Law were secured from school men, employers, and others interested. When criticisms had been received to the extent that the receipt of additional lists of criticisms did not increase the list numerically, the official list of criticisms was declared complete.

Each was then analyzed, and those facts which seemed necessary for determining the extent to which the criticism was justified were listed. This list of facts was then examined, and a series of studies or investigations which it was hoped would secure the needed facts was planned. A few criticisms almost defied objective analysis; the data needed in determining the correctness of other criticisms would have required considerable time and money, neither of which the committee had in great abundance. It was found, however, that a number of studies could be made which would have a fair degree of objectivity, within the time and with the staff available to the committee for its work.

Personal supervision of all of the studies was an impossibility, so various agencies were asked to aid. The Bureau of Business Research of Ohio State University agreed to gather

available statistics concerning the extent to which youths from fourteen to seventeen years of age were employed. A field worker provided by the same Bureau interviewed employers to discover, if possible, whether or not the attendance and child-labor law was causing employers to refuse to hire youths sixteen and seventeen years of age. This question assumed some importance since a wholesale refusal by employers would mean virtually compulsory attendance at school until the age of eighteen years.

THE Bureau of Educational Research agreed to gather data to show the relative competency of the high-school pupils of 1929 and 1930 in the subjects which they had studied for a half-year or a year when compared with that of the high-school pupils of 1920, 1921, and 1922 in the same subjects after having studied them for similar periods of time.[2] This study had considerable significance since many persons interested in school work claimed that present-day high-school pupils did not meet the standards which were met by high-school pupils eight or ten years ago; it was claimed, upon this assumption, that the reason for the lower grade of work was the fact that almost all young people were now being forced to attend high school. These critics asserted that such forced attendance brought into high school a great number of youths who did not have the ability to do the work, and that, in order to maintain a reasonably low failing rate, the standards of high-school work had been reduced. This study merely tried to compare high-school students of 1930 with high-school students of eight or ten years ago upon the basis of the mastery of subject-matter in certain fundamental high-school subjects.

The National Child Labor Committee agreed to send two representatives to Ohio in order to study school-attendance and child-labor conditions in some detail in three cities. These representatives spent from October 15, 1929, until May 1, 1930, in studying conditions at Middletown, Toledo, and Youngstown. In addition to these two full-time investigators, several other field workers were employed by the National Committee to assist on the case work both at Youngstown and at Toledo.

[2] Tyler, R. W. "High School Pupils of Today," EDUCATONAL RESEARCH BULLETIN, IX (October 22, 1930), pp. 409–11.

The purpose in this portion of the investigation was to discover to what extent the Law was being enforced. The school census of May, 1929, was corrected in each city studied in order that they might have a correct list of all youths fourteen, fifteen, sixteen, and seventeen years of age living within the local school district. After this corrected census list was secured, the field workers traced every child on the list. They determined the percentage in school, the percentage legally exempt, and the percentage out of school illegally. The workers determined the number of those out of school that was working and the number that was idle. They determined to what extent workers were certificated and to what extent they might have been certificated simply by making an application for a certificate. They called, in person, upon every youth who was employed and upon all young persons who were out of school and idle in order to discover the attitude of these workers and idlers toward the regular day school; toward the continuation school; and, if working, toward their jobs; and to discover, if possible, just what the idlers were doing.

The chief interest was to discover to what extent the present attendance and child-labor law was being enforced and to discover, if possible, why it was not being enforced in those cases where non-enforcement was discovered.

This problem was believed to be an extremely important one, since in many of the criticisms the operation of the Law was attacked. These criticisms included beliefs that youths older than fourteen are not being held in school, that many who should be certificated to work are not certificated, that youths who go to work do not get certificates, and that youths who are at work are not attending continuation school. The argument frequently is made, based upon these premises, that the Law should be repealed since it cannot be enforced.

THE Committee was assisted by thirteen graduate students at Ohio State University who agreed to make a study in nine county school districts in Ohio which would duplicate in all details the study which the National Child Labor Committee was making in the three city school districts. In each instance, the student who made the investigation held an official school position within the county: sometimes as the county superintendent and sometimes as school superintendent, principal,

or teacher within the system. Each of these thirteen students had attended Ohio State University during the summer, but held a regular position during the school year. It seemed important to make this study in representative county school districts as well as in city school districts since many of these criticisms with reference to non-enforcement had special application to rural-school territory.

A graduate student gathered data to determine to what extent the increasing costs of education were due to a law which kept youths in school until eighteen years of age.[3] The claim was made that the Law forced a great many youths who otherwise would not attend into school and that, therefore, the public-school enrollment was greatly increased; if the Law were repealed and those who would not profit by school were allowed to leave, enrollment would decrease, and there would then be a great reduction in the cost of education.

Another graduate student agreed to make an analysis of the reports concerning age and schooling certificates made annually to the State Department of Education by the school districts. This study was undertaken because of the criticism that the privilege to grant non-standard certificates was seldom utilized. The conclusions sometimes drawn upon the acceptance of this premise were that the Law was too rigid, and its requirements should be relaxed.

The Committee also obtained the assistance of two other graduate students at Ohio State University who made a study of youths fifteen, sixteen, and seventeen years of age who are now attending high school. An effort in this study was made to discover to what extent these young people attended high school voluntarily and to what extent they were attending because the Law compelled them to attend. This study directly related to the criticism that the increase in school costs is due to the school-attendance law which requires attendance until eighteen years of age. The criticism which suggests that the standards of high-school accomplishments are less at present than they were formerly is also related to this criticism.

[3] McClelland, J. B. "The Effects of the Bing Law," EDUCATIONAL RESEARCH BULLETIN, IX (September 24, 1930), pp. 353–59.

EDITORIAL COMMENT

Automobile Accidents

BEING in an inquiring mood a few evenings ago, the Editor ran through the tables of automobile fatalities for 1930 prepared by the Travelers Insurance Company and studied the modes of the different tables. He found that the person most likely to be killed was a pedestrian (46 per cent of the cases) between the ages of fifteen and fifty-four (55 per cent) who was crossing the road between intersections (27) on a clear (83) Sunday (18) afternoon (37). The automobile that struck him was a passenger car (77), not a truck, in good running condition (95) driven by a man (93), not a woman, between the ages of twenty-five and fifty-four (70) who had been driving for more than a year (93). The surface of the road was dry (81), and the car was going straight ahead (78), but the driver was exceeding the speed limit (31).

All of which reminds us that it is a mistake to place the blame for fatalities upon children and women, trucks, darkness, rain, inexperienced drivers, wet roads, and other favorite topics of conversation where male adults forgather. The causes are personal. They lie in carelessness, fatigue, and insidious factors which operate when attention flickers. Driving a car is a solitary and narrow task. The driver cannot talk, enjoy the scenery, think about his troubles, or do anything else of interest. He is chained to a wheel and condemned to watch an ugly strip of asphalt monotonously stretching ahead. One wonders why he enjoys it.

W.W.C.

Association for Childhood Education

MERGERS are the order of the day—even educational institutions are joining to form larger, more powerful combines. The organization of the Association for Childhood Education is an event of unusual significance, for it joins in one the interests of nursery-school, the kindergarten, and the primary teacher. The International Kindergarten Union has already disbanded to join this Association, and the National Council of Primary Education is to merge its identity also, for

a committee to complete the arrangements was appointed by the Council during its recent meeting.

The union of these two national organizations is not a sudden venture. Following the meeting of the Department of Superintendence in 1929 Conferring Committees on Reorganization were appointed by the International Kindergarten Union and by the National Council. Five reasons for such a union of the teachers of the three typical schools devoted to the education of young children were proposed. These reasons were accepted as convincing arguments by the Executive Committees of the I.K.U. and of the Primary Council, so the Conferring Committee was authorized to devise a constitution and propose a name for the new organization. These were accepted by the I.K.U. at the Memphis meeting last April, and by the National Council at the Detroit meeting. The first three reasons stated by the Conferring Committee admirably state the case for the Association of Childhood Education.

1. The psychology of the child for the years from two to eight reveals common needs that indicate the necessity of the closest possible integration of the work of nursery school, kindergarten and primary grades. In no other ways can the best interests of childhood during these years be served.
2. Our normal schools and colleges of education have unified kindergarten and primary training in kindergarten-primary courses and departments, and have in several instances already introduced nursery-school training in this unit. Many of our school systems have unified the supervision of the kindergarten-primary grades, and there is a continuous general movement in that direction. Our teachers, therefore, with common training, supervision, and an integrated course, need a national organization for professional growth, which professedly in name and purpose represents their interests.
3. Such an organization could bring a greatly enlarged and more influential attack in promoting progressive nursery-school, kindergarten and primary work throughout this country, and in establishing kindergartens in communities which do not have them, and also in aiding legitimate development of nursery schools and parent education.

Theorists have devotedly espoused the cause of articulated training for the earliest years of the child's school life, but the longest step toward unified practices in the three first levels of the school has been taken in thus bringing the teachers with common interests and similar tasks together in the Association for Childhood Education. J. H. M.

READINGS

BURGESS, THOMAS O. "The Technique of Research in Educational Sociology," *Journal of Educational Sociology*, IV (January, 1931), pp. 272–78.

The writer of the articles states that a survey of the techniques of research in educational sociology are many and varied, but may be grouped under two general heads, techniques for securing data and techniques for treating data. Techniques for securing data are divided into five subtechniques: documents, observation and visitation, experimentation, consensus, and questionnaire. Techniques for treating data are divided into four subtechniques; description, analysis, comparison, and synthesis. Each of these subtechniques is further divided.

Examples of the techniques for securing data and the four techniques for treating data are presented with a criticism of the method and a statement of the limitation of the method of each. The writer bases his division of techniques upon a study of some three hundred published reports of studies in this field.

GATES, ARTHUR I. "What Do We Know about the Optimum Lengths of Lines in Reading?" *Journal of Educational Research*, XXIII (January, 1931), pp. 1–7.

After summarizing studies by Weber, who in 1881 decided that the optimum length for a reading line was 140 to 150 mm., Dearborn, whose 1905 investigations led him to favor a line ranging from 75 to 88 mm., and Blackhurst, who decided in 1927 that the optimum was 10 mm., Mr. Gates reports his own research in the field. After a well-planned problem in which both experimental and control groups participated, and in which tests were made of oral reading and number of errors, the author concluded that no really significant facts had been unearthed, and that "the most plausible assumption is that children do tend to become habituated to a line of the length in which their materials are predominantly set up."

YOUNG, O. E. "Migratory Trends of High-School Graduates; 1900–1930," *Phi Delta Kappan*, XIII (February, 1931), pp. 148–51.

According to the findings of this study, high-school graduates migrate freely beyond the borders of the state, the percentage of migration being greater than for the population in general. Out of twenty-six hundred Indiana students who are studied, 25 per cent have moved beyond the boundaries of the state. Only 39 per cent were living in the home community. The most popular distance for migration is from one hundred to five hundred miles, and there is a distinct trend toward the large city communities away from the rural and small city communities. Only when cities reach the ten thousand population mark does the influx of high-school graduates from other places equalize the exodus.

The investigator, in the light of his findings, wonders if the national government should not assume some responsibility for bearing the expense involved in public secondary education. It would seem to be a matter of

good policy to establish such a system of high schools as would insure to any state the ingress of as well-educated people as it is losing by migration. The results of this investigation raise several additional problems; for instance, to what extent should a community provide high-school instruction adapted to the local needs when only 39 per cent of the people thus trained remain in the locality of the school? Another problem raised is with regard to what effect the drain of their potential leadership will have upon the small communities. College graduates are found to be only 10 per cent more migratory than those who took no additional work beyond the high school.

MacDonald, Marion E. "Students' Opinions as Regards Desirable and Undesirable Qualifications and Practices of Their Teachers in Teacher-Training Institutions," *Educational Administration and Supervision*, XVII (February, 1931), pp. 139–46.

In this study 320 students in a three-year teacher-training institution representing equally Freshmen and Seniors were given fifty minutes in which to list qualities and practices of their teachers of which they approved or disapproved. A total list of thirty-four approved qualities of teachers were mentioned by ten or more students. *Sense of humor* ranked first, followed by *justice, consideration, friendliness, appropriate dress, good voice,* and *neatness.* Out of thirty-eight traits disapproved by students, *injustice* came first, and the other qualities that ranked high were *lack of consideration, poor voice* and *address, prejudice, poor appearance, sarcasm, conceit,* and *poor English.* It would seem that appearance is an important qualification even for teachers of advanced students. Assignments and tests among the practices of teachers seem to share the brunt of conspicuous approval or disapproval.

Bowman, Earl C. "The Problem of the Early Prognosis of Teaching Success," *Educational Administration and Supervision*, XVII (February, 1931), pp. 95–102.

In lieu of the prevalent oversupply, this investigator believes that we must increasingly consider the problem of pre-training selection of teachers. If an effective prognosis may be made early in the life of the student, great service may be rendered to society and to the individual. A careful consideration of the problem reveals, however, that the outlook for scientific selection is as yet far from promising. Neither the criteria for teaching success as expressed by superintendents and principals nor the methods of prognosis are as yet sufficiently reliable to be helpful. Nevertheless, as little above chance as our present means of prediction are, with reference to pre-training selection, they are probably as good as those applied after the training period is over. "Considering all the human values involved, it appears that we have little to lose and much to gain by making most of our elimination before rather than after teacher-training courses are begun."

Payne, E. George, and Archer, J. L. "Narcotics and Education," *Journal of Educational Sociology*, IV (February, 1931), pp. 370–79.

Publicity regarding the nature and effects of the use of narcotic drugs may, in the opinion of certain sociologists, either increase or decrease the use of drugs. These two diametrically opposite views on the effects of instruction

concerning the use of narcotic drugs have prompted a study to answer three questions: What is the legal status or requirements relating to instruction in the various states? What are the school practices throughout the country? and, What do school children know about drugs and what is the source of their information?

An analysis of state laws was made to discover the answer to the first problem. Instruction in the nature and effect of the use of narcotic drugs is required by law in every state. All but one state has requirements as to the placing of emphasis in such instruction. An answer to the second question was secured through the use of the questionnaire. Returns, numbering 704 questionnaires, gave evidence of the nature of four types of school practices. The data indicate that the educators are concerned about the problem of narcotic drugs and are giving consideration to its importance. A program has been outlined to solve the third problem. A preliminary study has been made to reveal the nature of the larger investigation and to set up several hypotheses which will be tested. The test includes fifteen narcotic drug terms to form a basis for comparison.

In Paper Covers

WILLIAMS, ARTHUR P. *The Conference Procedure in Teaching Vocational Agriculture.* Washington: Federal Board for Vocational Education, 1930. 28 pp. (Agriculture Series No. 38)

This bulletin is well written and is full of most excellent suggestions for teachers and supervisors of agriculture. The conferences are stressed, certain aims are suggested, and topics for discussion to bring forth the specific purposes of the conferences are a part of the book. It is pointed out that the success of the conference depends upon the ability of the teacher or supervisor to arouse pupils to do concrete thinking, and further to prepare pupils to learn, and to want to learn, more about the farm and home interests.

GEORGE M. MORRIS

UNIVERSITY OF THE STATE OF NEW YORK. *Organization of Special Classes for Subnormal Children.* Albany, New York: University of the State of New York, 1930. 9 pp. (Bulletin No. 940)

This pamphlet is a handbook in outline form. Its purpose is to set up a criterion for the establishment and conduct of special classes for subnormal children. The theory set forth is well founded in experience, gained through the establishment of 320 special classes in the public-school system of the state of New York (exclusive of New York City with its 410 special classes) in 1929. Definite standards are established as to qualifications for teachers of special classes, size of classes, selection of pupils, classroom equipment, and the like.

RALPH M. STOGDILL

REUSSER, WALTER C. *Equalization of Educational Opportunity and Equalization of School Support in Wyoming.* Cheyenne, Wyoming: Wyoming State Teachers Association, 1929. 52 pp. (Research Bulletin No. 1)

This study was made to determine the status of educational opportunity and school support in the state of Wyoming. The financial ability, effort, and

accomplishment of counties and school districts were analyzed. Sparse population of the state made necessary the measurement of special educational needs. The ability to support education is measured by the assessed valuation of the school district. A minimum educational program for the state is set up and defined in two ways: first, in terms of the amount of money available, and, second, in terms of the minimum elements that should be included in such a program. The method which is favored for supporting the minimum program is that of combined state and local support. It is a recognized fact that the equalization of educational opportunity and of school support is a pressing educational problem of today.

FRED P. FRUTCHEY

ARCHER, CLIFFORD P. *Transfer of Training in Spelling.* Iowa City, Iowa: University of Iowa, 1930. 63 pp. (University of Iowa Studies in Education, Vol. V, No. 5)

From five hundred to one thousand children in six different groups were given a preliminary test of 60 or more words varying with the experiment. Each group then carefully studied either 15 basic words; that is, such words as "reduce," "create," or these words with the prefix *s* added thereto, or the basic words with *ed* or *ing* or *tion* added or a mixed group. The errors made on the preliminary test were noted, and if these errors were eliminated in the second test five days later, or the third test three weeks later merely by studying a different form, positive transfer was considered to have taken place. If there was an increase in errors of the initial word tested after different forms had been studied, it was considered as negative transfer. A control group was utilized which did no studying whatsoever in order to discover what improvement could be expected without training. Teachers were specifically cautioned not to give spelling instruction in words not called for in the experiment.

The data indicate clearly that there is positive transfer of about equal amounts between the base forms of words, the *s* forms, the *ed* forms, and the *ing* forms. The author says, "From these data, one may conclude that it is unnecessary to teach all forms of these words." Negative transfer operated in the case of words which dropped the final *e* to add the suffix *ing*. Specifically when *create* was learned first, it developed a tendency to retain the *e* when writing the word *creating*. If *creating* was studied first, there was a tendency to spell the word *create* without an *e*. If these transfer effects are found with words other than those studied in the experiment, it would appear that the almost universal prescription of three to four thousand spelling words for elementary-school curriculum needs careful scrutiny.

EDGAR DALE

ADAMS, ROY EDGAR. *A Study of the Comparative Value of Two Methods of Improving Problem Solving Ability in Arithmetic.* Philadelphia: Westbrook Publishing Company, 1930. 68 pp.

This study is based upon the performance of experimental and control groups carefully equalized and involving more than four thousand pupils from the third and fourth grades. Two methods are used: analysis, which is not described in detail, and the method which requires such questions as, "What

are we asked to find?" and "Shall we add, subtract, multiply, or divide?" The results show that the analysis method was of some advantage in the third grade, but in Grade IV there was no significant difference.

W. J. OSBURN

Books to Read

RUGG, HAROLD. *A History of American Civilization.* Boston: Ginn and Company, 1930. xvii+636 pp.

This is the third volume in the Rugg Social Science Series planned for junior high schools. The present book, like the preceding volumes and the three to follow it, has a background of careful experimentation based on the Rugg pamphlets used in the Lincoln School and scores of other schools whose teachers have kept in touch with the author. The text presents ten units of work, each embracing from one to five chapters.

Mr. Rugg covers the story of American history from Columbus' voyage to the present day, with a major emphasis upon economic and social factors. As on other occasions, he has made excellent use of not only maps and pictures, but also of charts and graphs. His style is a clear and fascinating one well adapted to the academic level for which he has chosen to write. Moreover, it will be noted that although the present volume and the one to follow it deal with all topics generally included in American history texts, they nevertheless devote more than twice the usual amount of space to a clear and ample presentation of these topics. Such completeness will be of great advantage to schools having limited libraries. The author also recognizes that problems must be presented to pupils in any subject if reflective thinking is to be fostered, and to this end a work book and teacher's guidebook are designed to supplement this text.

P. A. TOLL

SHANG, CHUNG I. *A Method of Selecting Foreign Stories for the American Elementary Schools.* New York: Teachers College, Columbia University, 1929. 46 pp. (Teachers College, Columbia University, Contributions to Education, No. 398)

Perusal of this thesis leads one to anticipation of reading with interest the forthcoming publication of thirty Chinese folk tales, which the author has translated into English as the culmination of his study. Believing that China has rich strands to be woven into the fabric of human culture, and also that the outside world's knowledge of the literature of a country contributes to its sympathetic understanding and interpretation of that country, Mr. Shang has endeavored to seek out the best that China has to offer for children, and to make these stories available for the American school child.

From a careful study of the judgments of accepted authorities on aesthetics, literature in general, children's literature, and recent scientific investigations of children's reading interests, the author set up criteria for the evaluation of the material. After reading twenty thousand pages of Chinese folk literature, he selected 1,030 stories and subjected them to a series of elemination tests. The first of these tests excluded those stories which presupposed an intimate knowledge of Chinese social, historical, traditional, and linguistic backgrounds, as well as those which required an adult's understanding of

mysticism, symbolism, love, and romanticism. Seven hundred fifty stories survived this test. The next test eliminated those which did not meet the literary and aesthetic standards. This test was applied three times with intervals of one week between each testing. The means of his three estimates were used as the final judgment. To the 350 stories which then remained, the author applied a test based upon the factors constituting interest for children. This test was also applied three times with intervals of one week elapsing between each test, and again the means of the three tests were taken as final, following which a rank order was assigned to the 350 stories. Next he translated into English the twenty-five stories that ranged highest and five others that bore a vital relation to them. In translating these, it was his endeavor to preserve the Chinese tone and structure of the stories.

In view of the fact that there has been a dearth of appropriate Chinese reading material for the American child, and that much of the little that has been written has been prepared by authors who have never been in China and whose ideas of Chinese life and culture are distorted and exaggerated, such a collection as this should constitute a valuable contribution to the reading of our elementary-school children.

AMY BRONSKY

KOCH, THEODORE WESLEY. "Reading: a Vice or a Virtue?" *A Library Miscellany Issued as a Souvenir of the Dedication of the Albert Emmanuel Library*. Dayton, Ohio: University of Dayton, 1929. xv+119 pp.

Reading has various objectives, among them fact-finding and time-killing. In Mr. Koch's belief, its highest aim is the attainment of true culture and the intercourse between the minds of two people: the author and the reader. Whether or not one agrees with this belief, one will enjoy this well-written and attractively printed book. One finished it with a feeling of having some of his own vague ideas clarified and of having some of his beliefs challenged and set aside.

The standards of value and bases of judgment presented are fundamentally true. In this present-day world, with its floods of reading material of all types, this sane discussion should help many a reader to preserve a true perspective of literature, from the "garbage-can school of fiction" to the classics.

RUTH E. SEEGER

WYER, JAMES I. *Reference Work*. Chicago: American Library Association, 1930. 315 pp. (Library Curriculum Studies)

The materials which the reference librarian uses, or the "world of print"; the approach to a reference question, search and research, special subjects and work in public, university and college, school and special libraries; and the administration of the reference department are clearly discussed in Mr. Wyer's volume which discusses, rather than lists, the problems of the librarian. The book is well indexed. The authority of a publication of the A.L.A. need not be questioned. It remains, therefore, to emphasize only the comprehensiveness and readableness of this book, which is a real contribution to the literature of reference work.

AUDREY KNOWLTON

NEW TESTS

ANOTHER means of testing the intelligence of kindergarten and primary children is available in the Non-Language Primary Mental Test, prepared by Rudolf Pintner, of Teachers College, and published by the Bureau of Publications, Teachers College, Columbia University. All the directions are given in pantomime as a game, and no verbal responses are required from the child. This is an attempt to equalize the differences in language opportunities found among children coming from good and poor homes. It makes possible the testing of children who do not understand English well. Because so much depends upon the effectiveness of the pantomime, the test is difficult to give, and requires an examiner who has rehearsed the directions several times before attempting to give the test. The validity as determined by correlations with the mental ages obtained on the Stanford Revision of the Binet test is .61. This indicates that the test measures some of the same elements as the Binet test, but the correlation is so low that it cannot be used with precision in determining the relative intelligence of individual children. Age and grade norms have been provided for the kindergarten and first three grades.

NEW achievement tests to be used in Grades III to VIII have been published by the Public School Publishing Company, Bloomington, Illinois. These tests, entitled Public School Achievement Tests, are prepared by T. L. Torgerson. They include reading, arithmetical computation, arithmetical reasoning, language usage, and spelling. The items were selected by analyzing leading textbooks, modern courses of study, and investigations of difficulty of curricular material. The arithmetic and spelling tests are highly reliable, and can be used for measurement of the achievement of the individual pupil. The reading and language-usage tests are somewhat less reliable, but will give an accurate measurement of the mean achievement of grades or classes. Since they are not essentially diagnostic in character, their greatest usefulness will be in surveys of classes and school attainment. The five tests may be given in three hours.

THE possibilities of individualizing instruction and systematizing learning exercises through printed practice materials has resulted in the publication of a large number of practice exercises and work books. A new series, Practice Exercises in Reading, for the third grade has been published by the Bureau of Publications, Teachers College, Columbia University. These booklets were prepared by Arthur I. Gates and Celeste Peardon. They have been developed as a result of Mr. Gates's extensive investigations in primary reading. He classifies reading into four types: reading to appreciate the general significance of a selection, reading to predict the outcome of given events, reading to understand precise directions, and reading to note details. A separate book of practice exercises is provided for each of these types of reading. Pupils having difficulty with one or more types may be given the corresponding sets of practice exercises. A manual accompanies the booklets in which suggestions for determining the types of difficulties encountered by the pupils and methods of conducting practice periods are described. Evidence is also presented to show the gain in reading-test scores which have been made by pupils using the practice exercises. There are a number of features of these exercises which make them superior for remedial purposes to the use of the ordinary school reader alone.

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What Is Statistical Significance?

[*Continued from page 118*]

we need to be able to express them in terms of recognized social values. The research worker who reports his data in terms of abstract scores without further explanation is encouraging his readers to make gross errors in interpretation. The only way that the social significance of differences can be appreciated is for the research worker to show what these differences amount to in terms of weeks of schooling, hours of effort, depth of satisfaction, or other recognized social values.

CONFERENCE NOTES

HEADLINERS for the Eleventh Ohio State Educational Conference to be held April 9 to 11 on the Ohio State University campus will be Newton D. Baker and James R. Angell, who will be speakers at the evening session of Thursday, April 9, Carlos Davila and Sir Willmot Lewis, who will address the delegates and visitors at the general session Friday evening.

Mr. Baker, who was Secretary of War from 1916 to 1921 in the Wilson Cabinet, was also a member of the Court of International Justice at The Hague. He is now a member of the law firm of Baker, Hostetler, and Sidlo at Cleveland.

President Angell, of Yale University, has acted as chairman of the National Research Council, and is a former president of the Carnegie Corporation. He is the author of *Psychology* and *Chapters from Modern Psychology.*

The Hon. Carlos Davila is Chilean Ambassador to the United States. Educated in South America, he also studied at Columbia University and the University of Southern California, and so will be able to interpret education in the light of his experiences in both the Americas. He is one of the leading South American journalists, formerly editor of *La Nacion.*

Sir Willmot Lewis, the correspondent of the *London Times* at Washington, will also address the Journalism Section.

Two additional sectional speakers are also being announced. M. R. Trabue, a North Carolina visitor, is director of the Bureau of Educational Research of the University. He has prepared tests for use in North Carolina schools and for the guidance of high-school Seniors. He is a member of the National Committee on Visiting Teachers, and is in charge of a demonstration area of visiting teachers in North Carolina. He is, at present, assisting in the study of social science in schools for the American Historical Association.

Henry Cowell, American composer, is an outstanding figure on the music program. He is a pianist and is well known on the concert stage. He is editor of *New Music,* a quarterly periodical devoted to publishing new music by American composers, is president of the Pan American Association of Composers, and head of the Music Department of the New School for Social Research, in New York City.